2. That, as many forms of oral sepsis are not associated with pain, the patient rarely complains of the condition of the mouth, and as his general appearance and symptoms are frequently strongly suggestive of anaemia, the true state of the case may easily be overlooked.

3. That it is a common cause of disorders of the stomach, is directly associated with different forms of arthritis, and that it either predisposes the individual to, or at times directly gives rise to, suppurative processes in other parts of the body.

4. That at critical periods in the life of an individual, as for example at puberty, during pregnancy, at the climacteric or in the course of a chronic disease, it may be the all-important factor in the case.

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AUTOGENOUS VACCINES IN THE TREATMENT OF CHRONIC JOINT AFFECTIONS

(RHEUMATOID ARTHRITIS AND GONORRHOEAL ARTHRITIS).

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RHEUMATOID ARTHRITIS is, I think, a misleading term. I would prefer to call the condition "metastatic arthritis"—that is, metastatic to some infective focus in the body.

The joint is swollen and more painful at times than at others; the muscles around the joint show marked wasting. On palpation the local temperature may be slightly raised, the synovial membrane is thickened and fringing of it may be felt. On movement of the joint a soft crackling is felt, very different to the bony creaking felt in osteo-arthritis, which latter I consider to be quite a different disease, although in more elderly subjects rheumatoid arthritis may pass on to a condition of osteo-arthritis. Further, in some cases of rheumatoid arthritis there is a considerable quantity of free fluid in the joint cavity, and lateral mobility in the joint itself can be obtained.

Pathologically, rheumatoid arthritis presents features of a chronic infection, the synovial membrane is pinker than normal, it is soft and succulent, and often villous processes project from it. The articular ends of the bones beneath the articular cartilages show rarefaction, while microscopically there is present some extent of rounded infiltration in the synovial membrane. Although the synovial membrane is thickened, it does not show a tendency to ulcerate or undergo destructive changes, as in the case of tubercle, and possibly syphilis.

I have repeatedly tried to obtain cultures from the fluid aspirated from these joints, using various culture media, but in no case with success. It has been suggested, and I think feebly, that the organisms present are in such a low state of virulence and numbers that they will not grow; others have said that the organisms lie hidden in the connective tissues of the synovial membrane, but a very careful search in a series of cases failed to reveal any such organisms. Other observers assert that they have been able to grow organisms from these joints, and have produced this villous type of rheumatoid arthritis in rabbits by inoculating the animal with this organism; but such observations have not been confirmed.

I think we can safely say that the cause is not a form of tubercle. There is no tendency to caseation or to the formation of abscesses and sinuses or to destruction of articular cartilage. Von Pirquet's reaction has invariably been negative; this fact, though proving nothing, at any rate helps in excluding tubercle.

Further, I think we can exclude syphilis. It is true there is a type of syphilitic rheumatoid arthritis, but it is rare, and rheumatoid joints do not resemble syphilitic joints. Out of a large number of cases tested only a very small percentage have given a positive Wassermann reaction. The majority gave a negative history of syphilis, and those who gave a positive Wassermann reaction and in whom there was other evidence of syphilis did not respond to antisyphilitic treatment only, as far as their joints were

concerned. I would, however, suggest that the Wassermann reaction be tried in these cases, for if it be positive it is well to administer antisyphilitic treatment along with treatment appropriate for the joint condition.

I have been interested some five years in this disease, and am becoming more convinced that rheumatoid arthritis is due to metastasis from some infective focus. The disease attacks the young and middle-aged, and in children there is that form called Still's disease, the cause of which is not yet ascertained.

Metastatic arthritis may commence at so early an age as 15 or 16. Commonly we see it in young women at 18 years and upwards. From 35 years onwards to the menopause it is again common. Frequently it is said to follow parturition, and other diseases affecting the female genital organs.

The three main points in the treatment of this disease are:

1. To find the infecting organisms.
2. Having found them, to raise the opsonic index of the individual against these organisms; this is most quickly accomplished by the use of autogenous vaccines.
3. Having rendered the patient artificially immune, to remove where possible the primary focus and apply local treatment to the affected joints.

The commonest foci of infection in my cases have been the following:

The Teeth.

Pyorrhoea alveolaris is frequently associated with rheumatoid arthritis. I have frequently seen cases who have been to American dentists and have been fitted with a dental plate. On removing the plate a series of stumps have been disclosed beneath it, bathed in pus of a most offensive kind containing a very mixed infection. Gold crowns are also bugbears. A dentist friend, by way of experiment, placed a gold crown over a carious molar tooth of his own and awaited results. He developed joint pains, rheumatic pains about the shoulders and back, which subsided immediately the crown was removed. The tonsillar crypts are also another source of infection. I have at present a case of a woman suffering from a very progressive type of rheumatoid arthritis, the primary focus being a pair of caseous, dirty tonsils, causing her, amongst other things, to have a most offensive breath.

In cases of pyorrhoea I have found the following form of treatment give most satisfactory results, and in a number of cases cure.

The mouth should be thoroughly washed and the teeth scrubbed for two or three days with normal saline solution without antiseptics. This gets rid of all extraneous matter from the teeth. At the end of three days a small quantity of pus is squeezed up from the gum, a slide taken, and agar tubes inoculated.

It has been a well-marked phenomenon that in these cases of mouth infection there is marked breaking up of the leucocytes seen on the slide taken, and very few of the organisms are intracellular. In brief, there is a poor attempt at phagocytosis. A vaccine is prepared and an initial dose, varying with the patient, given. After the second injection, if a second slide be taken and stained, it is often remarkable to see the phagocytosis present. It is now evident that the opsonic index is increasing, and this is the time to remove the septic stumps and bad teeth.

I have known cases in which doctors have advised patients to have their teeth removed for this condition. The whole mouth has been cleared at one sitting, and after all this the patient's joint condition has become worse. The teeth should be removed two or three only at a time, and this only after the opsonic index has been raised. Otherwise a large raw surface for absorption is opened up to organisms to which the patient has but poor resistance. If many stumps are removed while the patient's immunity is being artificially increased by means of autogenous vaccines, anaphylactic symptoms appear.

This treatment of joints associated with pyorrhoea has given such gratifying results that I now use it as a routine procedure.

In caseous tonsils a vaccine should be prepared and given, and then enucleation of the tonsils performed.

The Nose and Naso-pharynx.

Rheumatoid arthritis in connexion with septic polypi in the nasal cavities is not uncommon. In a girl aged 18, who had rheumatoid arthritis well started in the joints of the fingers of both hands, a vaccine containing *Micrococcus catarrhalis* and *Staphylococcus aureus* was made from her own discharge. There was in this pus no attempt at all at phagocytosis. She was vaccinated, but phagocytosis was most marked after the second inoculation of the vaccine. The polypi were then removed and she made a complete recovery from her joint trouble, having had no recurrence, either in the joints or of the polypi.

Chronic suppuration in the sphenoidal and frontal sinuses and in the antrum of Highmore are again possible foci of infection. I have opened a knee-joint for acute pneumococcal infection following on a pneumococcal infection of the maxillary antrum.

Chronic Otorrhoea.

I have seen one case of rheumatoid arthritis of both knee-joints clear up in a middle-aged woman after vaccine inoculation combined with clearing out of the antrum and middle ear. Here, again, few bacteria were intracellular. It is therefore very important in cases of these metastatic joints to make a thorough examination to exclude a primary focus in the mouth, nose, throat, and ear.

The Lungs.

Rheumatoid joints have been associated with bronchitis and bronchiectasis. I remember a case of the disease associated with bronchitis in which the pneumo-bacillus was isolated. A vaccine was prepared and given and the joint condition improved markedly, and finally the patient went back to work.

The Intestinal Tract.

Rheumatoid arthritis is often associated with dyspepsia, and I have seen it in association with chronic gastric ulcer and chronic appendicitis. With both these conditions there is a degree of intestinal stasis. I have frequently opened the abdomen and found the condition of pericolicitis of a membranous kind affecting peristalsis. I can recall cases of marked amelioration in rheumatoid joints after gastro-enterostomy and ileo-sigmoidostomy, and Mr. Arbuthnot Lane has had cures. In this type of case vaccines do not produce much benefit. The condition causing the stasis must be removed. An x-ray examination should be made after a bismuth meal and any stasis or kinks looked for. If the intestine can be proved to be working efficiently, a very careful bacteriological examination of the urine should be made. If organisms are found—notably *B. coli*, in the absence of intestinal stasis—a vaccine should be made, and in this special type of case I have seen a great deal of good follow.

Leucorrhoea.

This often dates from a confinement, and in a number of cases I have examined I have found a displaced uterus and retention of some products of conception which have become adherent to the uterine wall. Any inflammatory condition in the uterine annexes will by contraction tend to deviate the uterus and cause passive congestion with leucorrhoea. Cultures taken from inside the cervix in these cases have shown mixed infections, the commonest form of organisms being the *B. coli*, a diplococcus, and staphylococci.

The vaccine base should be given prior to rectifying the uterus, so as to raise the immunity. I have seen many cases made worse by curettings and other operative procedures performed when the patient's immunity was low, but I have never seen anything but good follow when the surgical procedures have followed the second inoculation of the vaccine.

When once the primary focus is cut off and the patient's immunity raised to the particular infection, local treatment by Bier's bandage, Scott's dressing, etc., to induce an artificial hyperaemia with blood now enriched with opsonins, may be instituted. It is useless to resort to these local measures, and baths and spa treatment alone; the symptoms only and not the cause are treated. For contractions I usually apply extension during vaccine treatment. I have not seen drug cataphoresis do any good.

Chronic Gonorrhoeal Arthritis.

I believe this to be due to a mixed infection of the gonococcus and staphylococcus. The joints are characteristic. There is swelling and often oedema in the tendon sheaths around, well seen in the wrist-joint, marked pain, and a very early tendency to stiffness and limitation of movement of a most obdurate character. Adhesions form both within the joint and around it within the fibrous capsule, tending early to fix it. Any attempt at forcible movement is painful and only tends to again light up the trouble.

A vaccine should be made from the urethra by inserting the loop well into the meatus. The gonococcus grows best on slightly alkaline agar the surface of which has been smeared with decomplexed blood serum. I am very indebted to Dr. D'Este Emery for drawing my attention to this and sending me some tubes.

I give 100 million gonococci and 150 million staphylococci for a preliminary dose, and increase it to even 500 million gonococci and 1,000 million staphylococci, provided the reaction is not great. After the second dose an anaesthetic is given, and the adhesions in the joint broken down. I have seen no harm follow this proceeding, and with massage and daily movements while under the influence of vaccines I have patients back at their work again whose joints have been given up as hopeless. Bought vaccines do not appear to act so well as autogenous in these cases, and this has been most marked in some of my cases. Gonococcal arthritis is perhaps one of the types of case which best lends itself to autogenous vaccination.

Combined with this the chronic gleet should receive attention, and the best method I find is massaging the penis over a stout metal bougie passed into the urethra, followed by the insertion of a protargol bougie. Copaiba should at the same time be administered by the mouth.

VACCINES IN THE TREATMENT OF CHRONIC BRONCHITIS AND OF ASTHMA.*

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CHRONIC bronchitis, with a tendency to frequently recurring acute attacks, and asthma, with or without bronchitis, have this at least in common from the point of view with which I am here concerned—namely, that they are frequently obstinate in their character and difficult to cure. Any method, therefore, which gives better or more permanent prospects of relief than those commonly in use seems worthy of trial, and I hope to show by a survey of the cases I have had under treatment during the past three years that in vaccine therapy we have a remedy which, if it does not always effect a complete cure, does, at least in most instances, give considerable relief, even in cases where other measures have failed more or less completely.

RECURRENT BRONCHITIS.

The cases upon which this opinion is based are selected ones—not in the sense that I have picked out all those in which the results are good and discarded the others, but in the following respects: (1) All are cases in which the complaint was of some standing. (2) All have been under other forms of treatment for varying periods, but with more or less want of success. As, however, in most instances the other methods of treatment (medicinal, hygienic, etc.) were continued with, any difference in the results may fairly be attributed to the additional factor—that is, the vaccine. (3) Only those which have been under observation, or have been followed up, for some time have been included. This excludes cases which have only been under treatment quite recently and in which it is too soon to speak with any certainty as to the results; also those in which treatment was only carried out for very short periods and then, for one reason or another, given up. If the latter group were included, the failures would certainly bulk larger, but it would hardly be fair to judge a method by cases in which treatment had not been given a reasonably long trial.

* Read before the Medico-Chirurgical Society of Glasgow.